Energietechnik Essen
GMH GRUPPE

HNS 28 MP

Mat.-no.: 1.4028 mod. – X30CrN13

HNS® 28 MP is a stainless, martensitic chromium steel with a nitrogen content above the solubility limit. As a result, the material meets the highest requirements in terms of corrosion and wear resistance, while also offering excellent polishability.

HNS® 28 MP is the material of choice whenever high performance is required, for example in mould steels or bearings.

Key Advantages:
- Good corrosion resistance
- Excellent polishability
- Good machinability
- Good hardenability

MAIN APPLICATION AREAS

The primary applications of this steel grade include the automotive industry, the cutlery and blade industry, engine components, pump and valve components, electronic devices, and plastic mould making.

Properties: (1 = low – 10 = excellent)
- Weldability: 1
- Machinability: 9
- Wear resistance: 8
- Polishability: 10
- Corrosion rating: 9

The best corrosion resistance is achieved in a quenched and tempered condition (low tempering temperature) combined with a polished surface.

Chemical Analysis (wt.%)

1.4028 mod.	C	Si	Mn	Cr	Mo	N
min.	0,20	-	0,30	13,0	-	0,30
max.	0,30	1,00	0,60	15,0	0,15	0,60

Chemical Analysis (wt.%)

Thermal Conductivity [W/m·K]

20°C	200°C	300°C	500°C
19.7	23,4	24,3	25,0

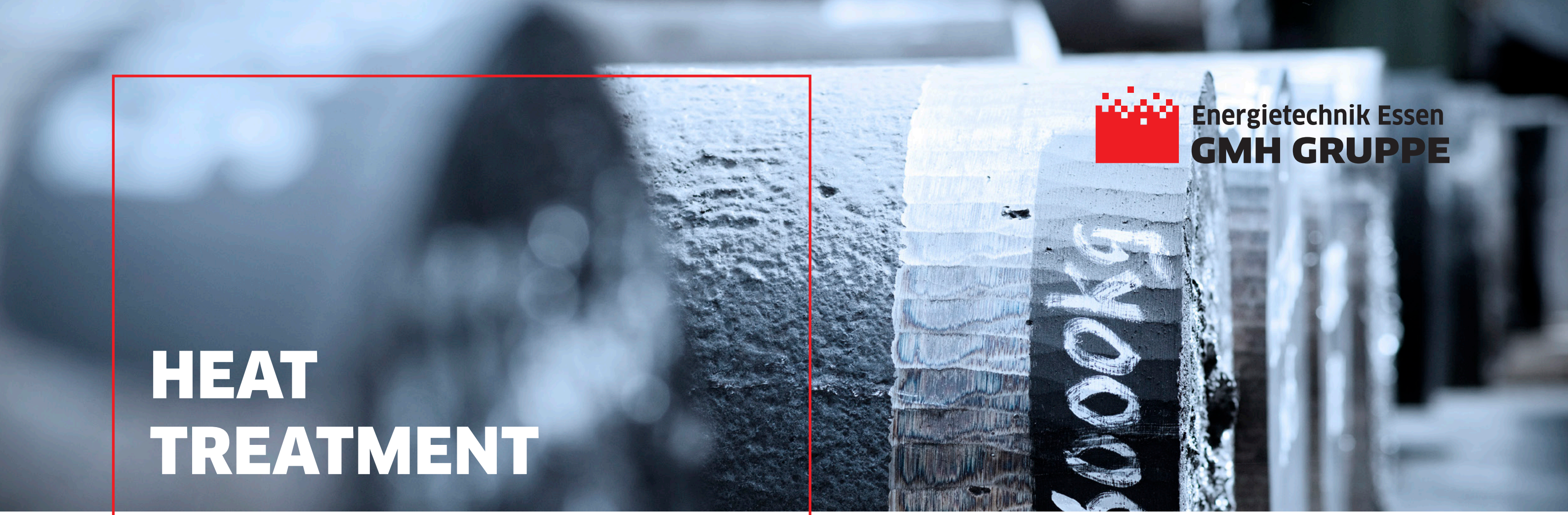
Mean Thermal Expansion (K^{-1})

20-100°C	20-200°C	20-300°C
10,2	10,8	11,2

Elastic Modulus (kN/mm^2)

20°C	200°C	300°C	500°C
217	203	197	181

Hot Forming
Hot forming should be carried out in the temperature range between 1100 and 800 °C.



HEAT TREATMENT

Soft Annealing
HNS® 28 MP must be heated uniformly to a temperature of 730 – 780 °C. The holding time after complete soaking is approx. 8 hours. After final furnace cooling, a hardness of ≤ 250 HB is obtained.

Hardening
Uniform heating to the required austenitizing temperature with the usual holding steps is assumed.

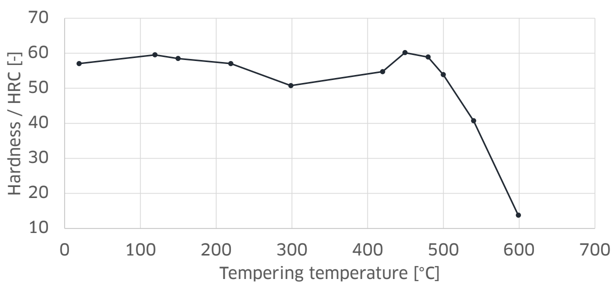
The austenitizing temperature can be selected between 1000 and 1030 °C, depending on the product requirements. The holding time after full homogenization must be sufficiently long to ensure that all carbides are dissolved.

When hardening in vacuum, an adjusted nitrogen partial pressure of 100 – 200 mbar is required in order to prevent nitrogen loss or nitrogen enrichment in the surface layer. If this is not possible due to equipment limitations, an all-round grinding allowance of approx. 0.2 mm must be considered to remove any potential surface effects.

Cooling
Cooling may be performed by air quenching or oil quenching. For vacuum heat treatment, a quenching overpressure of at least 5 bar is required.

Cryogenic Treatment and Tempering
After quenching to room temperature, cryogenic treatment at –80 °C should be carried out. Subsequently, tempering must be performed 2 × 2 hours at the appropriate temperature (according to the tempering diagram) to achieve the final properties.

Tempering Diagram:



Product Portfolio:

1.4028 mod.	Bars	Blanks Thickness
min. (mm)	20	30
max. (mm)	100	450

Other dimensions available on request.

Energietechnik Essen GmbH
Westendstraße 15 | 45143 Essen
GERMANY
www.energietechnik-essen.de

Your contact for HNS 28 MP:
Carsten Hellwig (Technical Customer Support)
T+49 172 5266564
carsten.hellwig@gmh-gruppe.de

Johann Lasse Junius (Sales Director High Nitrogen Steels)
T+49 160 1110269
lasse.junius@gmh-gruppe.de